

Request Sample

Contact to person in charge

Cited by applicants in 12/11/02 response.
Paper No. 5

Bisphenol A type Epoxy Resin	Bisphenol F type Epoxy Resin	High Purity Epoxy Resin	o-Oresol
Novolac Type	Brominated Epoxy Resin	Glycidyl Amino Type Epoxy Resin	Dimer Acid / Rubber Modified
Type Epoxy Resins	High Weatherable Epoxy Resin(Hidrogennated Bis-A Type)	Low Viscosity Epoxy	
Resins(Trimethylol Propane Type)	Castings grade Epoxy Resins	Reactive Diluent/Modified Type Epoxy	
Resins	Phenoxy Resins		

*Page 2
bisphenol
A diglycidyl
ethers with
epoxy
equivalent
weights of from
600-700
are solid*

<u>Bisphenol A type Epoxy Resin "Epo Tohto YD series"</u>		Manufactured by Tohto Kasei co.,ltd.				
Epo Tohto grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Softening Point	Solution Viscosity	Description
	(g/eq)	(mPa·s)	(gardner)	(°C)	(G - H)	
YD-115	180-194	700-1100	1MAX			Low viscosity for general use
YD-115CA	195-215	800-1600	1MAX			Non crystallizable & higher reactive
YD-127	180-194	8000-11000	1MAX			Low viscosity standard resin
YD-128	184-194	12000-15000	1MAX			Standard resin
YD-128G	184-194	12000-15000	1MAX			Less crystallizable
YD-128S	205-225	19000-24000	1MAX			Non-crystallizable
YD-128CA	200-230	12000-15000	1MAX			Non-crystallizable & higher reactive
YD-134	230-270		1MAX		O-U	Semi-solid for paints

Softening
point

YD-011	450-500		1MAX	60-70	D-F	Standard resin solid type
YD-012	600-700		1MAX	75-85	G-K	High flow for powder coatings
YD-013	800-900		1MAX	85-98	O-S	For powder coating
YD-014	900-1000		1MAX	91-102	Q-U	For powder coating and epoxy esters
YD-017	1750-2100		1MAX	117-127	Y-Z1	Higher reactivity for baking varnish
YD-019	2400-3300		1MAX	130-145	Z3-Z5	For precoated metal(PCM) and can coatings
YD-020N	3800-4000		1MAX	135-150	Z4-Z5	For PCM and can coating
YD-020H	5000-5500		1MAX	145-160	Z5-Z7	For PCM and can coating
YD-7011R	460-490		1MAX	60-70	D-F	High stability quality, for synthesis
YD-7017	1750-2100		1MAX	113-123	Y-Z1	For PCM, High adhesion
YD-7019	3000-4000		1MAX	125-135	Z2-Z4	For PCM, High adhesion
YD-901	450-500		1MAX	65-75	E-G	Water resistance for laminates
YD-902	600-700		1MAX	82-92	J-O	For powder coatings
YD-903N	780-840		1MAX	92-102	Q-U	For powder coatings
						For powder

YD-904	900-1000		1MAX	96-107	T-W	coatings
YD-907	1300-1700		1MAX	117-127	Y-Z2	For powder coatings
YD-909	1800-2500		1MAX	129-145	Z2-Z5	For powder coatings
YD-927H	1850-2150		1MAX	120-130	Y-Z3	High adhesion
YD-6020	3000-5000		1MAX		Z6-Z7	For PCM

Bisphenol F type Epoxy Resin "Epo Toho YDF series"

Bisphenol F type epoxy resins generally offer lower viscosity and more flexible than bisphenol A type epoxy counterparts.

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Softening point	Description
	(g/eq)	(mPa·s)	(gardner)	(°C)	
YDF-170	160-180	2000-5000	3MAX		Standard resin for non-solution, high solid coatings
YDF-175S	165-175	3000-4000	3MAX		Non-crystallizable
YDF-2001	450-500	B-D	3MAX	50-60	High flow for powder coating
YDF-2004	900-1000	K-O	3MAX	80-90	High flow for powder coating

Bisphenol A & F type High purity Epoxy Resin

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
YD-8125	170-175	4000-5000	1MAX	n = 0 purity98%min BPA type
YDF-8170C	155-165	1000-2000	1MAX	n = 0 purity98%min BPF type
ZX-1059	160-170	2000-3000	1MAX	n = 0 purity98%min

O-Cresol Novolac Type Epoxy Resin "Epo Toho YDCN series"

The advantage of o-cresol novolac epoxy resins over other types of epoxy resin have long been established in the outlet requiring the higher thermal stability and chemical resistance.

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
YDPN-638	170-190	H-K	3MAX	Phenol Novolac type for general use
YDCN-701	195-220	60-70	3MAX	o-Cresol Novolac type for general use
YDCN-702	195-220	70-80	3MAX	o-Cresol Novolac type for general use
YDCN-703	195-220	75-85	3MAX	o-Cresol Novolac type for general use and laminates
YDCN-704	195-220	85-95	3MAX	o-Cresol Novolac type for general use and laminates
YDCN-500	195-215		3MAX	o-Cresol Novolac type for general use and encapsulation

Brominated Epoxy Resin(Flame Retardant type)"Epo Toho YDB series"

The YDB product is used as a self-extinguishing agent for plastic electrical components.

< Solid type >

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Bromine content	Description
	(g/eq)	(°C)	(wt%)	
YDB-360	350-370	50-60	46-50	High crystallized
YDB-400	380-420	64-74	46-50	For general, laminates and encapsulation
YDB-405	530-630	90-105	49-52	Insulation powder coatiiong

< Liquid type >

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Bromine content	Description
	(g/eq)	(mPa·s)	(wt%)	
YDB-				60% toluene solution for phenolic

400T60	390-410	5-30	46-50	laminates
YDB-400EK60	390-410	A以下	46-50	60% methyl ethyl ketone solution for laminates

< Low Brominated Liquid type >

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Bromine content	Description
	(g/eq)	(mPa·s)	(wt%)	
YDB-500EK80	450-550	1000-4000	19-23	80% methyl ethyl ketone solution for laminates

Glycidyl Amine Type Epoxy Resins

The four epoxide groups in the resin are highly reactive as cross-linker and hence cured film shows a high level of thermal and chemical resistance.

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
YH-434	110-130	8000-18000	12MAX	4-functional(tetra glycidyl diamino disphenylmethane) for CFRP
YH-434L	110-130	5000-10000	12MAX	4-functional(tetra glycidyl diamino disphenylmethane) for CFRP, low viscosity

Dimer Acid / Rubber Modified Type Epoxy Resins

These flexible film epoxy resins are based on bisphenol A structure which is modified by dimer acids, diglycidyl ester, rubber, tertiary aliphatic acid, etc, as described below.

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
YD-171	390-470	400-900	12MAX	Diglycidyl ester of dimer acid
YD-172	600-700		6MAX	Diglycidyl ester of dimer acid
YR-450	400-500	25万-45万	12MAX	Rubber modified DGE of Bis A
		2000-		Liquid rubber modified triglycidyl ether of

YR-207	175-205	4000	10MAX	trimethylol propane
YD-716	305-330	2500-5000	3MAX	DGE of propylene oxide modified Bis A

High Weatherable Epoxy Resins(Hydrogenated Bis A Type)

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
ST-3000	225-235	2500-4000	1MAX	For Paints
ST-5080	550-650	78-88	1MAX	For powder coatings
ST-5100	900-1100	95-105	1MAX	For powder coatings
ST-4000D	650-750	85-100	1MAX	For powder coatings
ST-4100D	900-1100	95-110	1MAX	For powder coatings

Low Viscosity Epoxy Resins(Trimethylol Propan Type)

The trimethylol propane type resin is characterized by its low viscosity and excellent adhesion performance.

Epo Toho grade	Epoxy equivalent weight	Viscosity (cps/ 25°C)	Color	Description
	(g/eq)	(mPa·s)	(gardner)	
YH-300	135-200	100-200	1MAX	Tri-glycidyl ether of trimethylol
YH-301	145-165	180-220	1MAX	adhesives and paints
YH-315	165-180	700-100	1MAX	Modified tri-glycidyl ether of trimethylol
YH-324	185-200	3500-5500	1MAX	propane for adhesive and paints
YH-325	175-190	4000-6000	1MAX	propane for adhesive and paints

Castings grade Epoxy Resins

The casting grade epoxy resins are normally cured by acid anhydride hardeners to meet electrical specifications as well as low shrink requirements especially for transformers, insulator, gate switches, etc.

Epo Toho grade	Epoxy equivalent weight (g/eq)	Viscosity (cps/25°C) (mPa·s)	Color (gardner)	Description
YC-195N	370-420	50-60	1MAX	For large scale castings, Curable by Hardener YC-195H
YC-205	210-250	900-1500	1MAX	Cureable by Hardener YC-205H at ambient temperrature
YC-230	185-200	10000-15000	1MAX	For electrical castings Cureable by Hardener YC-230H

Reactive Diluent / Modified Type Epoxy Resins

Epo Toho grade	Epoxy equivalent weight (g/eq)	Viscosity (cps/25°C) (mPa·s)	Color (gardner)	Description
PG-202	135-165	15-30	1MAX	Diglycidyl ether of neopentyl glycol
PG-207	305-335	50-100	1MAX	Diglycidyl ether og polypropylene glycol
PP-101	220-240	10-20	5MAX	Mono glycidyl ether of sacbutylphenol
Neo Toho E	240-265	5-20	2MAX	Tert carboxylic glycidyl ester
Neo Toho S	240-260	5-15	1MAX	Tert carboxylic glycidyl ester for alkyd & acrylate

Pheno Resins (Pheno Toho)

The Pheno Toho series is a phenoxy resin high containing alcoholic hydroxyl as shown belowl which is produced from bisphenol A and epichlorohydrin.

Pheno Toho YP-50 and YP-50S are thermoplastic, and therefore are used on its own for paints, moldings, adhesives and others. In addition the Pheno Toho may be used as thermosetting resin when it is cross-linked by amino resins, isocyanate,etc.

Pheno Toho grade	Solution Viscosity (G-H)	Solid Content (%)	Color (gardner)	Description
YP-50	Z1-Z5	99以上	3MAX	For magnetic tape, PCM primer can, coatings,hot melt adhesives, molding

YP-50S	Z1-Z5	99以上	3MAX	composition,etc. YP-50S has a sharper distribution of molecular weight.
< Solution type >				
Pheno Tohto grade	Solution Viscosity	Resin Cont.	Color	Description
	(G-H)	(wt%)	(gardner)	
YP- 40ASM40	Z3-Z5	40±1.5	6MAX	For baking primer & can coatings
YP-50EK35	W-Z2	35±1.5	6MAX	For zinc rich primer & baking primer
Brominated Phenoxy Resins				
Pheno Tohto	Solution Viscosity	Resin Cont.	Color	Description
	(G-H)	(wt%)	(gardner)	
YPB- 40AM40	T-Z	40±1	5MAX	Brominated, high Glass Transition Temperature(Tg)

Latest up date April 2000